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UNITED STATES PATENT AND TRADEMARK OFFICE

**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Ex parte MICHAEL SEUL and CHIU CHAU

Appeal 2007-4325
Application 10/624,020
Technology Center 1600

Decided: December 19, 2007

Before DEMETRA J. MILLS, ERIC GRIMES, and RICHARD M.
LEBOVITZ, *Administrative Patent Judges*.

GRIMES, *Administrative Patent Judge*.

DECISION ON APPEAL

This is an appeal under 35 U.S.C. § 134 involving claims to a biological assay system. The Examiner has rejected the claims as obvious. We have jurisdiction under 35 U.S.C. § 6(b). We reverse.

BACKGROUND

The Specification discloses “a complete, functionally integrated system for the implementation of biochemical analysis in a planar, miniaturized format on the surface of a conductive and/or photoconductive substrate, with applications in pharmaceutical and agricultural drug discovery and in in-vitro or genomic diagnostics (Specification 1).

DISCUSSION

1. CLAIMS

Claims 47, 49, 50 and 55 are pending and on appeal. Claim 47 is the broadest claim on appeal and reads as follows:

Claim 47. A substantially planar substrate and a chip disposed thereon, which together form part of a biological assay system comprising:
several discrete hydrophilic regions which are part of a planar surface of the substrate, the hydrophilic regions being separated from other hydrophilic regions by a hydrophobic region which is part of said planar surface, wherein the hydrophilic regions are designed to accommodate the chip disposed thereon, the chip having a hydrophilic surface which faces said planar surface when the chip is disposed on the substrate and a surface opposed thereto with an array of particles deposited thereon, and wherein a biological reagent is bound to the particles.

2. OBVIOUSNESS

Claims 47, 49, 50 and 55 stand rejected under 35 U.S.C. § 103 as obvious in view of Rava¹ and Shivashankar.² The Examiner relies on Rava for disclosing “a chip plate comprising a plurality of test wells (planar substrate), each test well (hydrophilic region) having a biological chip having a molecular probe array” (Answer 3). The Examiner further finds that the “test wells are separated by a hydrophobic region” and that the “test

¹ Rava et al., US 5,874,219, Feb. 23, 1999.

² Shivashankar et al., US 6,139,831, Oct. 31, 2000.

wells comprise hydrophilic regions because they can accommodate aqueous sample” and on the basis that “[s]ince Rava teaches that the materials for forming the well plate/wafer or the substrate can be silicon or SiO₂ ... the substrate or well plate of Rava is also hydrophilic and the regions/well bottoms that hold the chip array are hydrophilic” (*id.* at 5, citing Rava at col. 9, lines 40-45).

The Examiner further finds that Rava “fails to teach that the chip has an array of particles deposited thereon, wherein a biological reagent is bound to the particles” (*id.* at 4). The Examiner relies on Shivashankar for disclosing “grafting an array of particles coated with a molecule such as a biomolecule, on to localized positions of semiconductor substrate (biochip)” (*id.*).

The Examiner concludes that “[i]t would have been obvious to one of ordinary skills in the art to immobilize particles, having biomolecules ... as taught by Shivashanka[r], onto the chip/substrate as taught by Rava since both teach coating [a] biochip with biomolecules because particles enable separation of specific biomolecules within a microfluidic chamber (wells) as taught by Shivashanka[r]” (*id.*).

Appellants argue that “[b]ecause the hydrophilic regions in the claimed invention act to hold the chip in place, and Rava does so by placing the chip in a test well (formed by raising a barrier ...), there is no suggestion of such discrete hydrophilic regions ‘which are part of a planar surface of the substrate ...’ in Rava” (Appeal Br. 4).

We agree with Appellants that the cited references do not support a *prima facie* case of obviousness. In particular, we agree that the Examiner

has not adequately explained how the references would have suggested “several discrete hydrophilic regions which are part of a planar surface of the substrate ... wherein the hydrophilic regions are designed to accommodate the chip disposed thereon” as recited in claim 1. “[A]s an initial matter, the PTO applies to the verbiage of the proposed claims the broadest reasonable meaning of the words in their ordinary usage as they would be understood by one of ordinary skill in the art, taking into account whatever enlightenment by way of definitions or otherwise that may be afforded by the written description contained in the applicant’s specification.” *In re Morris*, 127 F.3d 1048, 1054 (Fed. Cir. 1997).

The ordinary meaning of the term “hydrophilic” refers to the characteristic of a substance as having an affinity for water. The Specification does not provide a definition of “hydrophilic” nor does it use this term in a manner that would indicate anything other than the ordinary meaning of the term.

Given the ordinary meaning of the term “hydrophilic”, we do not agree with the Examiner’s conclusion that the test wells of Rava “comprise hydrophilic regions because they can accommodate aqueous sample.” (Answer 3.) In particular, we note that Rava teaches that the plates comprising wells are made of “(poly)tetrafluoroethylene, (poly)vinylidenedifluoride, polypropylene, polystyrene, polycarbonate, or combinations thereof” (Rava, col. 8, ll. 61-63), substances that are generally known not to be hydrophilic.

Further, the teaching in Rava cited by the Examiner as disclosing that the substrate can be made of silicon or SiO₂ (i.e., Rava at col. 9, lines 40-45),

based on which the Examiner finds that the well bottoms that hold the chip array are hydrophilic, is in a section entitled “D. Biological Chips” (Rava, col. 9, l. 16) and not in the section entitled “C. Biological Chip Plates” (Rava, col. 7, l. 64). Thus, that teaching applies to the biological chips contained in the wells of the plates and cannot be reasonably extrapolated to suggest that the plates that include the wells, or the wells themselves, are hydrophilic.

Thus, we agree with Appellants that the Examiner has not adequately shown that the cited references would have suggested to one of ordinary skill in the art at the time the invention was made the claim limitation of “several discrete hydrophilic regions which are part of a planar surface of the substrate ... wherein the hydrophilic regions are designed to accommodate the chip disposed thereon”.

We therefore agree with Appellants that the Examiner has not made out a prima facie case of obviousness based on the cited references.

REVERSED

dm

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